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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,919	08/04/2003	Potapov Sergey	Q75814	4930

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EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/632,919	<b>Applicant(s)</b> SERGEY ET AL.	
	<b>Examiner</b> Kevin P. Kerns	<b>Art Unit</b> 1725	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 January 2006 and 14 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4,6-17 and 19-27 is/are pending in the application.
- 4a) Of the above claim(s) 14-16,19,20,22 and 24 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-13 is/are allowed.
- 6) ☒ Claim(s) 1-4,6-10,17,21,23 and 25-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims 14-16, 19, 20, 22, and 24 drawn to a non-elected invention. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 6-10, 17, and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Dautartas et al. (US 6,582,548).

Dautartas et al. disclose a compression bonding method using laser assisted heating for bonding an element to a substrate, in which the method includes forming and disposing a continuous layer of aluminum 11 on a surface of a silicon-based substrate 7 at ambient temperature; and bonding the element (an oxide-containing member in the form of round lens 8 made of a silicon-based material such as silicon dioxide, or silica glass) by applying pressure 12 on the element (lens 8) toward the aluminum layer 11 (aluminum inherently contains native oxide films to be at least

Art Unit: 1725

partially ruptured during laser irradiation) while irradiating laser light (YAG laser at 1060 nm) on or through the element 8 (see Figures 4-6) to a bonding area between the element 8 and layer 11 for a predetermined period of time (abstract; column 2, lines 15-31 and 61-67; column 3, lines 1-51; column 4, lines 1-11; and Figures 4-6).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dautartas et al. (US 6,582,548) in view of Ainslie et al. (US 4,534,811).

Dautartas et al. disclose the features of independent claims 1 and 17 above.

Dautartas et al. do not specifically disclose the use of light in the UV wavelength range.

However, Ainslie et al. disclose a method and apparatus for bonding surfaces, in which the method includes providing a compression means (capillary tip 15) for joining elements (12,13) to form a joint 14 on the surface of an integrated circuit 11, while directing a laser beam from a pulsed or continuous laser source 22 through bore 17 of capillary tip 15 onto the area to be joined, such that the laser selectively can be a CO<sub>2</sub> laser (within the UV range) to apply heat energy necessary to bond the elements (12,13), depending on dimensions and geometries of the elements (abstract; column 1, lines 37-57 and 65-68; column 2, lines 1-48; and Figure).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the compression bonding method using laser assisted heating, as disclosed by Dautartas et al., by using the laser with UV light taught by Ainslie et al., in order to apply heat energy necessary to bond elements of differing dimensions and geometries (Ainslie et al.; column 2, lines 1-11).

### ***Allowable Subject Matter***

7. Claims 11-13 are allowed.

### ***Response to Arguments***

8. The examiner acknowledges the applicants' amendment received by the USPTO on January 24, 2006 and March 14, 2006. Prior 35 USC 112, 2<sup>nd</sup> paragraph rejections

Art Unit: 1725

have been overcome by the amendments. Previously allowable claim 11 has been written in independent form, thus making claims 11-13 in condition for allowance. The applicants have cancelled claims 5 and 18. The applicants are referred to above section 1 regarding the requirement to cancel the non-elected claims. Claims 1-4, 6-13, 17, 21, 23, and 25-27 are currently under consideration in the application.

9. Applicants' arguments filed January 24, 2006 (with regard to rejected claims 1-4, 6-10, 17, 21, 23, and 25-27) have been fully considered but they are not persuasive.

With regard to the applicants' remarks/arguments on pages 7-9 of the amendment dated January 24, 2006, the examiner respectfully disagrees with the three major arguments ("room temperature", "predetermined time", and "UV wavelength") set forth by the applicants. First, in the last paragraph on the bottom of page 7 of the remarks, the applicants mention a bonding temperature at tip 16 of 1250 C (column 2, lines 39-40 of Dautartas et al.). However, this statement is absent from the reference, and no such "tip 16" and "1250 C temperature" exists in the disclosure of Dautartas et al. Furthermore, heating is only disclosed as optional ("If desired..." on column 3, lines 43-46), such that room temperature would be the conditions under which bonding would occur if not desired. Also, only a small localized area on the elements to be bonded would be heated during the process, and the distant areas of these elements would be "approximately room temperature". Second, in reference to page 8 of the remarks, the limitation "predetermined time" would be a recurring condition under which repeated applications of the compression bonding process would determine an appropriate length

Art Unit: 1725

of time to obtain sufficient bonding, and this time value would be a constant, inherent feature within the bonding process, while having all other parameters (e.g. temperature) constant. Third, in reference to pages 8 and 9 of the remarks, a CO<sub>2</sub> laser (in addition to various lasers listed in column 2, lines 1-11 of Ainslie et al.) is operable to provide light "substantially in the UV wavelength range". Since laser power required for tip heating (1-10 watts – see column 2, lines 5-6 of Ainslie et al.), it is not particularly critical to use a particular type of laser and/or wavelength, and this is implied by the listing of many types of lasers. Furthermore, lasers are frequently operated with second, third, or fourth harmonic generators that correspondingly alter the operating frequency of the laser (e.g. Nd:YAG laser at 1064 nm, 532 nm, 355nm etc.). The primary reference (Dautartas et al.) discloses Nd:YAG at 1060 nm (actually 1064 nm), but a third harmonic generator would bring it to 355 nm, in the UV wavelength range. Many of the other lasers listed by Ainslie et al. would be operable in the UV wavelength range as well.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1725

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns 4/6/06*  
Primary Examiner  
Art Unit 1725

KPK  
kpk  
April 6, 2006